



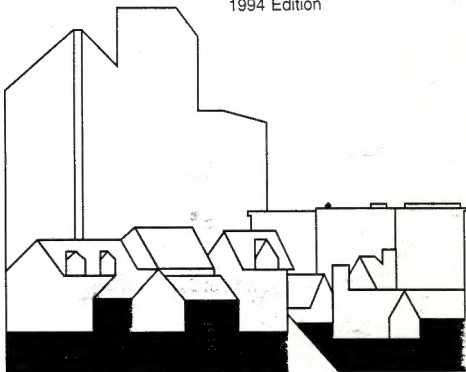
U.S. Department of Housing and Urban Development
Office of Housing

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4910.1

Minimum Property Standards for Housing

1994 Edition



MINIMUM PROPERTY STANDARDS FOR HOUSING
4910.1

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Office of Assistant Secretary for Housing -
Federal Housing Commissioner
Washington, DC

1994 Edition

FOREWORD

These Minimum Property Standards reference nationally recognized model building codes for concerns relating to health and safety. Locally adopted building codes can be used for the same purpose when they are found acceptable by the HUD Field Office.

These standards establish the acceptability of properties for mortgage insurance, and will further the goal of a decent and a suitable living environment for every American family. These standards will protect the Department's interest by requiring certain features of design and construction which are not normally required by state and local codes. These requirements will insure the durability of the project for the life of the mortgage.

Nicolas P. Retsinas
Assistant Secretary for Housing -
Federal Housing Commissioner

Introductory Statement

These Minimum Property Standards (MPS) are intended to provide a sound technical basis for the construction of housing under the numerous programs of the Department of Housing and Urban Development. MPS Handbook 4910.1 was originally published for multifamily housing with each page marked MF. The Handbook applies to all types of housing. Chapters 1 thru 6 and Appendices A thru J apply to only multifamily and care-type housing. Appendix K applies to property which is not multifamily or care-type housing. The standards describe those characteristics in a property which will provide present and continuing utility, durability, and economy of maintenance.

The MPS for Housing (4910.1) are intended to be used in all jurisdictions. In areas where the Department has found the local code acceptable, these MPS are to be used in conjunction with the local code. In areas where the Department has not accepted the local building code, these MPS are to be used in conjunction with a nationally recognized model building code designated by the Department.

Finally, in areas where the Department has partially accepted a local building code, the MPS are to be used in conjunction with the local building code plus those portions of a nationally recognized model code designated by the Department.

The requirements contained in this handbook and in the indicated codes define the minimum level of quality acceptable to HUD. Other factors and considerations affect the level of quality of the property. The level of quality will be considered by the Department during the valuation process. Procedures for evaluation of design considerations, project eligibility and valuation analysis are set forth in HUD program handbooks and other applicable Federal and local regulations and standards.

Environmental quality is also a relevant consideration. As a general policy, development of all properties must be consistent with the national program for conservation of energy and other natural resources, and care must be exercised to avoid air, water, land and noise pollution and other hazards to the environment. Orderly and efficient development responsive to residential needs, preservation of good existing natural surroundings, conservation of fossil fuels, and careful consideration of environmental factors are essential for the furtherance of this policy.

GENERAL TABLE OF CONTENTS

	Page
Chapter 1 - General Use -----	1-1
Chapter 2 - General Acceptability Criteria -----	2-1
Chapter 3 - Site Design -----	3-1
Chapter 4 - Building Design -----	4-1
Chapter 5 - Materials -----	5-1
Chapter 6 - Construction -----	6-1
Appendix A - Definitions -----	A-1
Appendix B - Abbreviations -----	B-1
Appendix C - Materials Standards -----	C-1
Appendix D - Test Methods and Performance Criteria -----	D-1
Appendix E - Accepted Engineering Practice Standards -----	E-1
Appendix F - Use of Materials Bulletins -----	F-1
Appendix G - SI Conversion Units -----	G-1
Appendix H - Minimum Property Standards Reference Sources-----	H-1
Appendix I - 24 CFR 200.925a-c Rules for Multifamily and Care-type Housing -----	I-1
Appendix J - Model Code Provisions for Use in Partially Accepted Code Jurisdictions -----	J-1
Appendix K - 24 CFR 200.926 Rules for One and Two Family Dwellings and Flood Hazard Exposure -----	K-1

Page numbers of the MPS indicate the chapter first and the page within the chapter second. Appendices are similarly numbered.

TABLE OF CONTENTS

		Page
CHAPTER 1	GENERAL USE	
100	APPLICATION -----	1-3
100-1	Proposed Construction -----	1-3
100-2	Housing for the Elderly -----	1-3
100-3	Requirements for Accessibility to Physically Disabled People -----	1-9
100-4	Requirements for Care Type Facilities -----	1-10
100-5	Existing Construction -----	1-10
101	VARIATIONS TO STANDARDS -----	1-11
101-1	New Materials and Technologies -----	1-11
101-2	Special Conditions -----	1-11
101-3	Variation Procedures -----	1-11
102	LOCAL CODES AND REGULATIONS -----	1-12
102-1	Codes as Standards -----	1-12
102-2	Compliance with Codes -----	1-12
103	REFERENCED STANDARDS -----	1-12

CHAPTER 1
GENERAL USE

100 APPLICATION

100-1 PROPOSED CONSTRUCTION

General

These Minimum Property Standards apply to buildings and sites designed and used for normal multifamily and care-type occupancy, including both unsubsidized and subsidized insured housing. The requirement of compliance with these standards under specific programs administered by the Department is prescribed in program regulations promulgated by the Department. Generally, these standards regulate the nature and quality of the property within its property lines. However, some standards require certain off-site conditions. See, for example, §204-1, which requires street access to the property.

100-2 HOUSING FOR THE ELDERLY

This Section includes Uniform Federal Accessibility Standards (UFAS) at 24 CFR Part 40, Appendix A and variations, additions and exceptions to the MPS for the above types of housing, when housing is to be for the elderly.

The number of accessible housing units which must be built will be determined on a project-by-project basis in accordance with the requirements of the program under which the project is to be built. Accessible housing units shall also meet all the facility accessibility requirements of UFAS.

100-2.1 Handrails

Handrails for exterior steps not attached to dwellings shall be provided in accordance with UFAS on both sides of a tenant stairway with a flight rise exceeding 24" and width exceeding 4 ft., and on one side when the width is 4 ft. or less.

100-2

HOUSING FOR THE ELDERLY - Continued

- (4) The nursing portion of the project shall be clearly incidental to the purpose of providing housing, and the ratio of nursing beds to living units shall not exceed 1 to 4.
- (e) Medical Facilities - Where a doctor's office with examination and treatment rooms is provided, it shall be designed to serve project residents. Spaces provided for rental to doctors, dentists, oculists, opticians, etc., shall be within the limits of allowable commercial space and located so as not to interfere with the residential space.
- (f) Central Dining - Where mandated by the program requirements, space shall be provided for meals.
- (g) Central Kitchen Facilities - The kitchen shall be arranged and equipped for adequate and efficient: food storage; preparation in proper sequence; serving; dish and utensil cleaning and storage; and refuse storage and removal. In projects consisting of 20 or more living units, the dishwashing activity shall be separated from that of food preparation. All cabinets and equipment provided shall be designed and installed to prevent contamination by insects, rodents, other vermin, splash, dust and overhead leakage.
- (h) Central Bathing Facilities - Such facilities shall be located on the same floor and close to the living units served.

When provided, a central bathroom shall contain:

- (1) Space for dressing and the movement of wheelchairs provided in accordance with the requirements of UFAS, Section 4.

100-2 HOUSING FOR THE ELDERLY - Continued

100-2.8 Stairs

The maximum riser height for stairs is 7".

100-2.9 Elevators

- a. Elevators complying with UFAS shall be provided in buildings of three or more stories; or two stories if any accessible living unit is located on a floor which does not have all common facilities.
- b. At least one elevator car in each building shall be suitable for handling ambulance stretchers and have a minimum capacity of 2500 lbs. and minimum size as required for service elevator under 614-1.

100-2.10 Emergency Lighting

Emergency lighting shall be provided for every public space, corridor, stairway, elevator and other means of egress. The lighting shall provide a minimum of 1 footcandle measured at the floor.

100-2.11 Flame Spread

The flame spread rating of walls and ceiling shall not exceed 75.

100-2.12 Wall Finishes

Abrasive wall finishes such as a sand finish shall not be used.

100-2.13 Floors

- a. Floors shall be slip-resistant.
- b. Adjacent dissimilar materials shall be flush with each other to provide an unbroken surface. Thresholds and Expansion Joint covers shall be flush with the floor.

100-2 HOUSING FOR THE ELDERLY - Continued

100-2.19 Night Light

A convenience outlet for receiving a night light shall be provided approximately 2 ft. above the floor between the bed location and the bathroom.

100-2.20 Emergency Call Systems

In projects containing 20 or more living units, each bathroom and one bed location in each living unit shall be furnished with one of the following emergency call systems: an emergency call system which registers a call (annunciator and alarm) at one or more central supervised locations, an intercommunicating telephone system connected to a switchboard which is monitored 24 hrs a day, or an emergency call system which sounds an alarm (not the fire alarm) in the immediate corridor and automatically actuates a visual signal in the corridor at the living unit entrance.

100-3 REQUIREMENTS FOR ACCESSIBILITY TO PHYSICALLY DISABLED PEOPLE

All multifamily dwellings covered by the Fair Housing Amendments Act of 1988, for first occupancy after March 13, 1991 must be designed and constructed to have at least one building entrance on an accessible route and shall be designed and constructed in such a manner that:

- 100-3.1 The public and common use areas are readily accessible to and usable by disabled persons:
- 100-3.2 All the doors designed to allow passage into and within all premises are sufficiently wide to allow passage by disabled persons in wheelchairs; and
- 100-3.3 All premises within covered multifamily dwelling units contain the following features of adaptable design:
 - a. An accessible route into and through the covered dwelling unit;

100-5 REHABILITATION CONSTRUCTION - Continued

new bathrooms and kitchens; or (3) the general replacement of the interior of a building. This may or may not include changes to structural elements such as floor systems, columns or load bearing interior or exterior walls. Rehabilitation construction shall comply with the standards for new construction and with the provisions of the program handbook for the particular program. New construction on cleared or vacant land or additions to an existing building which enlarge the floor area or height of the building shall meet the standards for new construction.

101 VARIATIONS TO STANDARDS

101-1 NEW MATERIALS AND TECHNOLOGIES

These standards are intended to encourage the use of new or innovative technologies, methods and materials. See Subchapter 613 of this handbook. Alternatives and non-conventional or innovative methods and materials shall be equivalent to these standards in the areas of quality, durability, economy of maintenance, operation and usability.

101-2 SPECIAL CONDITIONS

Certain conditions in the geographic area or on the site may justify modification of specific standards, or make compliance with the standards impracticable or impossible. In these cases, variations in accordance with procedures given in 101-3 may be permitted.

102-1.1 COMPLIANCE WITH CODES

The Department of Housing and Urban Development does not assume responsibility for enforcing or determining compliance with local codes and regulations or for making interpretations regarding their application for purposes of the local government. However, if compliance with the provisions of a local code is required in accordance with 24 CFR 200.925 or .926, then the Department is responsible for determining compliance and issuing interpretations for the Department's purposes.

103 REFERENCED STANDARDS

These standards must be used in conjunction with the information or requirements listed in Appendices A through I, which are incorporated herein by reference. Compliance with these standards and the requirements in the appendices does not obviate the need for compliance with any other applicable Federal, State or local requirements.

1-13

1994

TABLE OF CONTENTS

		Page
CHAPTER 2	GENERAL ACCEPTABILITY CRITERIA	
200	GENERAL -----	2-3
201	REAL ESTATE ENTITY -----	2-3
202	SERVICES AND FACILITIES	
202-1	Trespass -----	2-3
202-2	Utilities -----	2-3
203	SITE CONDITIONS	
203-1	Hazards -----	2-3
203-2	Unforeseen Conditions -----	2-4
204	ACCESS	
204-1	Streets -----	2-4
204-2	Access to the Buildings and the Nondwelling Facilities -----	2-4

CHAPTER 2

GENERAL ACCEPTABILITY CRITERIA

200 GENERAL

These general acceptability criteria apply to existing as well as new construction.

201 REAL ESTATE ENTITY

The project site shall comprise a single plot, except that two or more parcels separated by other parcels or a street or streets may be acceptable provided the resulting parcels comprise a readily marketable real estate entity. In either case, the property shall be sufficiently grouped to assure that convenient and efficient management during operation can be expected.

202 SERVICES AND FACILITIES202-1 TRESPASS

The property shall be so designed that it can be used and maintained without trespass upon adjoining properties.

202-2 UTILITIES

Utilities and other facilities shall be independent for the property, without dependence upon other properties.

203 SITE CONDITIONSHAZARDS

The property shall be free of those hazards which may adversely affect the health and safety of the occupants or the structural soundness of the improvements or which may impair the customary use and enjoyment of the property. These hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, subsidence, flood, erosion, expansive or compressible soils, inadequate drainage outfall, landslides or mudflows, and deposition of suspended solids or others located on or off site. Projects with potentially significant hazards may be acceptable if any such hazards are effectively mitigated.

TABLE OF CONTENTS

		Page
CHAPTER 3	SITE DESIGN	
300	GENERAL -----	3-3
300-1	Design -----	3-3
301	THE PROPOSED SITE	
301-1	Topography -----	3-3
302-2	Ground Water -----	3-3
302	LAND USE	
302-1	General -----	3-3
302-2	Noise Control -----	3-3
303	LOTS, YARDS, AND BUILDING SETBACK DISTANCE	
303-1	General -----	3-4
303-2	Building Parking Setback Distance -----	3-4
304	PARKING AREAS -----	3-4
305	WALKS -----	3-4
306	GRADING DESIGN -----	3-4

CHAPTER 3
SITE DESIGN

300 GENERAL

300-1 DESIGN

A site design shall be provided which includes all site facilities necessary to create a safe, functional, convenient, healthful, durable and energy efficient living environment for residents. The site design shall include an arrangement of the site facilities which accomplishes these purposes.

301 THE PROPOSED SITE

301-1 TOPOGRAPHY

In the design of a site, the effect of topographic conditions on the costs of development and operation shall be considered when locating various uses on the land. Land uses shall be combined with site conditions in a manner which assures a functional and economical maintainable development and in a manner which permits correction of potential hazards.

301-2 GROUND WATER

Buildings, structures, streets, paved areas and utilities shall be located on the site in areas of the least ground water hazard.

302 LAND USE

302-1 GENERAL

Site conditions shall be considered in land use planning for multifamily housing.

302-2 NOISE CONTROL

Through the use of site design techniques such as building location and orientation, window placement and the use of barriers, predictable undesirable site noise shall be moderated to meet the requirements of 24 CFR Part 51, Environmental Criteria and Standards.

TABLE OF CONTENTS

		Page
CHAPTER 4	BUILDING DESIGN	
400	GENERAL -----	4-3
400-1	Building Design -----	4-3
401	SPACE PLANNING -----	4-3
401-1	Non-Residential Spaces -----	4-3
401-2	Baths -----	4-3
402	ACCESS AND CIRCULATION -----	4-3
402-1	Doors and Openings -----	4-3
402-2	Handrails and Railings -----	4-4
402-3	Elevators -----	4-4
403	VENTILATION -----	4-5
403-1	Crawl and Attic Spaces -----	4-5

CHAPTER 4

BUILDING DESIGN

400 GENERAL

400-1 BUILDING DESIGN

Building design shall provide for ease of circulation and housekeeping, visual and auditory privacy, accident protection, accessory services and economy in maintenance and use of space.

401 SPACE PLANNING

401-1 NON-RESIDENTIAL SPACES

Management and maintenance space shall be provided commensurate with the number of living units served. Also, space shall be provided for necessary staff where social services are provided.

401-2 BATHS

401-2.1 Every living unit shall be provided with a water closet, lavatory and a bathtub or shower.

401-2.2 Shower compartment floors and walls shall be finished with a wear resistant and non-absorbent surface to a height of not less than 6 ft. above the floor.

402 ACCESS AND CIRCULATION

402-1 DOORS AND OPENINGS

402-1.1 Living Unit Doors

Living unit entrance doors shall be side-hinged doors not less than 3 ft. in width and 6 ft. 8 in. in height.

4910.1

402.3-2

Service or Combination Elevators

In elevator type buildings, at least one of the elevators shall have a minimum capacity of 2500 lbs and minimum size as required for service elevators under 614-1.

403

VENTILATION

403-1

CRAWL AND ATTIC SPACE

403-1.1

Crawl Space

- a. The space between the bottom of the floor joists and the earth under any building (except such space as is occupied by a basement or cellar) shall be provided with a sufficient number of ventilating openings through foundation walls or exterior walls to ensure ample ventilation. Such openings shall be covered with a corrosion-resistant wire mesh with a mesh size not greater than 1/2 in. nor less than 1/4 in. in any dimension. The minimum net area of ventilating openings shall not be less than 1 sq. ft. for each 150 sq. ft. of crawl space area.

403-1.1

Crawl Space - Continued

One ventilating opening shall be within 3 ft. of each corner of each building where such openings are required.

- Exceptions:
- (1) Ventilation openings may be vented to the interior of buildings where warranted by climatic conditions; and
 - (2) The total area of ventilation openings may be reduced to 1/1500 of the under floor area where the ground surface is treated with an acceptable vapor retarder material, and one such ventilation opening is within 3 ft. of each corner of said building. The vents may have operable louvers.

TABLE OF CONTENTS

	Page
CHAPTER 5	
MATERIALS	
500 GENERAL -----	5-3
500-1 Materials -----	5-3
507 THERMAL AND MOISTURE PROTECTION -----	5-3
507-1 Building Insulation -----	5-3
507-2 Caulking and Joint Sealants -----	5-3
508 DOORS, WINDOWS, GLAZING PANELS -----	5-3
508-1 Performance Testing -----	5-3
508-2 Metal Doors and Frames -----	5-4
508-3 Wood Doors -----	5-4
508-4 Metal Windows -----	5-4
508-5 Wood Windows -----	5-5
508-6 Hardware -----	5-5
509 FINISH MATERIALS -----	5-6
509-1 Exterior Wall Finishes -----	5-6
509-2 Finish Flooring, Rigid -----	5-6
509-3 Finish Flooring, Resilient -----	5-7
509-4 Carpets and Mats -----	5-9
509-5 Painting -----	5-9
513 SPECIAL CONSTRUCTION MATERIALS -----	5-9
513-1 Definition -----	5-9
513-2 Usage -----	5-9
513-3 Requirements for Acceptance -----	5-9

CHAPTER 5

MATERIALS

500 GENERAL

500-1 MATERIALS

Materials installed shall be of such kind and quality to ensure that the dwelling will provide acceptable durability, economy of maintenance and adequate resistance to weather, moisture, corrosion and fire. The local HUD Field Office may request evidence of a material's compliance with the requirements of the structure's plans and specifications and these MPS. Product labels are considered acceptable evidence.

507 THERMAL AND MOISTURE PROTECTION

507-1 BUILDING INSULATION

Materials used for insulation shall be of proven effectiveness and adequate durability so as to ensure that required design specifications concerning heat transmission, sound control and fire rating are attained. Insulation in contact with the ground shall be installed so as not to be adversely affected by soil, vermin and water.

507-2 CAULKING AND JOINT SEALANTS

Materials used for caulking and sealants shall be suitable for the use intended, and shall be compatible with the materials to which they are applied and with any finish that may be applied over them.

508 DOORS, WINDOWS, GLAZING PANELS

508-1 PERFORMANCE TESTING

All windows and sliding glass doors shall be tested for air infiltration, water penetration and physical loading as set forth in Appendix D. The test unit shall be either the largest size marketed by the manufacturer or the size designated in the referenced standard. All windows and sliding glass doors shall meet or exceed the minimum performance levels set forth in Appendix D.

windows or doors shall comply with AAMA 1503.1-88, Condensation Resistance of Windows, Doors and Glazed Wall Sections. Where wood is to be used as the insulator, it shall be treated with a water repellent preservative. Storm sash are acceptable to serve this purpose if a thermal separation is provided between the prime and the storm window, where both window frames are metal.

508-4.2 Steel Windows

Steel windows shall bear a label that identifies the manufacturer, certifies compliance with the tests required in Section 508-1, identifies the certifying organization, and states the maximum size of the unit tested.

508-4.3 Aluminum Windows

Aluminum windows shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable standard.

508-5 WOOD WINDOWS

508-5.1 Operating Wood Windows

Operating windows shall be manufactured units consisting of the frame, sill, sash, weatherstripping and operating hardware. Job site assembled windows composed of frames and sashes made by different manufacturers are not acceptable.

Each operating wood window unit shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol and shall certify compliance with the applicable standard.

508-5.2 Fixed Sash Windows

Fixed sash windows such as picture windows and bay windows, may be manufactured, job-built or job assembled units.

508-6 HARDWARE

508-6.1 Hardware shall comply with Section 402-1.2. Locks shall meet or exceed the performance criteria of ANSI A156.2-89 for the series and grades as follows:

5-5

509-3 FINISHED FLOORING, RESILIENT

The thickness of resilient flooring may be less than required by the referenced standards in Appendix C, but no less than the thickness shown in Table 5-9.1.

509-4 CARPETS AND MATS

Carpet cushions shall comply with the requirements of UM 72-80. Carpets shall comply with the requirements of UM 44C-78.

509-5 PAINTING

509-5.1 Lead Content

No paint shall contain more than 0.06 percent lead by weight calculated as lead metal in the total nonvolatile content of liquid paints or in the dried film of paint already applied.

509-5.2 Suitability

If a paint to be used on exterior surfaces is not inherently mold resistant, a suitable fungicide shall be included in the formulation.

513 SPECIAL CONSTRUCTION MATERIALS

513-1 DEFINITION

Special or alternate construction materials and products are those which are new or are not covered by specific requirements in these standards or in the referenced standards in Appendices C, E & F.

513-2 USAGE

Special or alternate materials and products may be used as prescribed in Section 101-1 and in HUD Handbook 4950.1 Technical Suitability of Products Program, Technical and Processing Procedures.

513-3 REQUIREMENTS FOR ACCEPTANCE

Special or alternate materials and products will be accepted for use in multifamily structures in accordance with the procedures set forth in HUD Handbook 4950.1.

TABLE OF CONTENTS

		Page
CHAPTER 6	CONSTRUCTION	
600	GENERAL -----	6-3
602	SITE -----	6-3
602-1	Site Utilities - Underground Utilities -----	6-3
602-2	Roads and Walks -----	6-3
603	CONCRETE -----	6-4
603-1	Interior Concrete Slabs-on-Ground -----	6-4
603-2	Exterior Concrete Slabs-on-Ground -----	6-4
606	WOOD -----	6-4
606-1	Termite Protection -----	6-4
606-2	Decay Protection -----	6-5
606-3	Wood Construction -----	6-5
607	THERMAL AND MOISTURE PROTECTION -----	6-5
607-1	Energy Requirements -----	6-5
607-2	Flashing -----	6-6
607-3	Gutters and Downspouts -----	6-6
608	DOORS, WINDOWS AND GLAZING -----	6-7
608-1	Door Performance - General -----	6-7
608-2	Exterior Doors -----	6-7
608-3	Windows -----	6-8
608-4	Glazing -----	6-8
609	FINISH MATERIALS -----	6-8
609-1	Finish Flooring, Rigid -----	6-8
609-2	Resilient Flooring -----	6-8
609-3	Painting -----	6-9
609-4	Wall Coverings -----	6-13
609-5	Other Finishes -----	6-13
611	EQUIPMENT -----	6-14
611-1	Kitchen and Vanity Cabinets -----	6-14
613	SPECIAL CONSTRUCTION -----	6-15
613-1	Factory-Produced (Modular or Panelized) Housing -----	6-15
613-2	Swimming Pools -----	6-15

CHAPTER 6
CONSTRUCTION

600 GENERAL

All work shall be performed in a workmanlike manner and in accordance with good usage and accepted practices. All materials shall be made and installed so they perform in accordance with their intended purposes.

602 SITE

602-1 SITE UTILITIES - UNDERGROUND UTILITIES

602-1.1 Underground piping and related items shall be protected from corrosion. Underground mechanical and electrical systems shall be protectively coated to minimize corrosion where soil conditions warrant. Where applicable, sacrificial anodes may be used.

602-1.2 Sacrificial anodes may be used where soil resistivity does not exceed 15,000 ohm - centimeters. Otherwise, an impressed current system of corrosion prevention shall be used.

602-2 ROADS AND WALKS

602-2.1 GENERAL

Surfaces and base courses for roads, streets, parking areas and walks shall be durable materials. Their construction shall be in conformance with generally accepted local design practices.

602-2.2 Drainage

Adequate surface and underground drainage systems shall serve all paving and improvements so as to ensure continuing stable soil support for these improvements.

606-1.2 Soil treatment and pressure treated lumber are chemical barriers.

606-2 DECAY PROTECTION

606-2.1 Protection Against Damage by Decay

Where required by the HUD Field Office, protection against damage by decay shall be provided.

606-3 WOOD CONSTRUCTION

The 1991 Edition of the National Design Specification for Wood Construction shall be used, including the 1991 supplement.

607 THERMAL AND MOISTURE PROTECTION

607-1 ENERGY REQUIREMENTS

607-1.1 Energy Efficiency

All buildings shall be constructed in compliance with the requirements of the CABO Model Energy Code, 1992 Edition except Sections 101.3.1, 101.3.2, 101.3.3 and 502.1.2, but including the Appendix. The values to be used for the table contained in Section 302.1 of the Model Energy Code are to be those for the area in which the building is to be constructed. Information concerning heating and cooling degree days for particular locations shall be obtained from the ASHRAE Handbook of Fundamentals; ASHRAE Heating Cooling Load Calculations Manual; the NAHB-RF Insulation Manual for Homes and Apartments; local utilities; or the National Climatic Data Center Manuals are available from NAHB-RF, or NAIMA.

Other sources of heating degree day and summer cooling data may be used, if acceptable to the HUD Field Office.

607-1.2 Thermal Mass

In addition to the energy criteria set forth in Section 607-1.1, the design of a property may take into consideration the thermal mass of building components. However, thermal mass may be considered only to the extent that the developer or other interested party can

607-3.1 Continued

- c. A gutter having approximately the same cross section as the downspouts shall be used for spacings of up to 40 ft. between downspouts. For each additional 20 ft. of gutter, the gutter width shall be increased by 1 inch.
- d. Strainers shall be installed at the head of the downspout when the downspout is connected to an underground drain.
- e. Details of any built-in gutters shall be submitted to the HUD Field Office for acceptance.

607-3.2 Scuppers

- a. Scuppers shall be installed at the outfall end of a valley for special roof designs, such as "butterfly" roofs.
- b. Scuppers shall be installed for overflow of all roofs enclosed by parapet walls, except when the construction of the roof and the type of roof covering used are designed to hold water. Suitable overflow devices shall be used.

607-3.3 Downspouts

Downspouts shall be sized on the basis of 100 square feet of roof surface to 1 square inch of leader. More or less leader area may be required by the HUD Field Office.

608 DOORS, WINDOWS, AND GLAZING

608-1 DOOR PERFORMANCE - GENERAL

Doors shall be durable, installed in good operating condition, free of defects, latch readily and lock securely.

608-2 EXTERIOR DOORS

608-2.1 Weatherstripping

All exterior doors and weatherstripping shall be properly fitted so as to eliminate excessive infiltration of air.

609-3 PAINTING

609-3.1 Application

- a. Application of paints, stains, or other coating systems shall be in strict accordance with manufacturer's directions.
- b. Additional coats may be required if the finish surface does not provide coverage or hiding that is acceptable to the HUD Field Office.

609-3.2 Exterior Wood Surfaces

Exterior wood surfaces shall be finished as follows:

- a. Wood Siding, Millwork and Trim
 - (1) Knots, resinous wood, and nail holes shall be sealed with a prepared sealer or aluminum paint prior to puttying and priming. Any nail holes or cracks in surfaces to be painted shall be filled with putty.
 - (2) A prime coat shall be applied to all surfaces to be painted before or immediately after installation. Primer shall be formulated specifically for application to unfinished wood. Finish coats formulated to serve as primers may be used.
 - (3) One of the following finish systems shall be applied. Coverage shall be that which will provide at least the minimum thickness recommended by the manufacturer.
 - (a) Oil paint systems.
 - (b) Latex paint systems.
 - (c) Pigmented stains as per manufacturer's directions.
 - (d) Clear penetrating preservatives or water repellent finishing systems.

609-3.4 Exterior Metal

a. Galvanized Steel or Iron

- (1) Field painting shall consist of two coats. One coat shall be a primer formulated specifically for galvanized surfaces, and the second coat shall be a finish coat. A finish coat formulated to serve as a primer may be used as the first coat.

b. Steel, Iron or Terne Plate

- (1) Steel or iron, except stainless steel, weathering steels, or steel treated with coatings to provide corrosion resistance, shall be painted.
- (2) A rust inhibitive primer and a finish coat shall be applied.

609-3.5 Interior Wood Surfaces

a. Millwork and Trim

- (1) All mill work and trim, including windows; interior doors; window, door and base trim; paneling and closet shelving and trim shall be finished by painting or natural finishing.

(2) Painting

If the surface is open grain wood, it shall be filled or sealed to prevent the grain from rising. Surfaces shall be treated with a primer. One or more finish coats shall be applied to provide a smooth surface and good hiding.

(3) Finished Material

Natural finishes include stain-wax, stain followed by one or more coats of varnish, clear coats of varnish with or without wiped paint undercoats or oil and wax finishes.

609-4 WALL COVERINGS

Covering material shall be secured to a suitable base in accordance with the manufacturer's directions.

609-5 OTHER FINISHES

609-5.1 General

Other finishes shall be installed in accordance with the manufacturer's directions.

609-5.2 Carpeting and Cushioning

Carpeting and cushioning shall be installed in accordance with the Specifiers Guide for Contract Carpet Installation, published by the Carpet and Rug Institute. The carpet shall be installed over one of the following suitable underlayments:

- a. A finish floor as provided and described in Section 509 and 609;
- b. A troweled concrete floor;
- c. A plywood subfloor. The top ply of plywood shall be at least "C plugged" grade;
- d. A plywood, hardboard or particleboard underlayment over any other subfloor described in this paragraph.
- e. Other materials where they provide a smooth, hard, durable surface.

611 EQUIPMENT

611-1 KITCHEN AND VANITY CABINETS

611-1.1 General

- a. All manufactured factory finished cabinets shall comply with ANSI A161.1-86, Recommended Minimum Construction and Performance for Kitchen and Vanity Cabinets, or with an equivalent standard.

613 SPECIAL CONSTRUCTION

613-1 FACTORY-PRODUCED (MODULAR OR PANELIZED) HOUSING

613-1.1 Structural Features

HUD Handbook 4950.1, Technical Suitability of Products Program Processing Procedures, describes procedures to be followed in order to obtain acceptance of structural features of housing not covered by the MPS.

613-1.1 Non-Structural Features

These features include methods of construction, systems, sub-systems, components, materials and processes which are not covered by the MPS. See HUD Handbook 4950.1 for procedures to be followed in order to obtain acceptance of non-structural components or materials.

613-2 SWIMMING POOLS

Where semi-private swimming pools are to be built, their design and construction shall comply with ANSI/NSPI 1-91, American National Standard for Public Swimming Pools.

614 ELEVATORS

614-1 MINIMUM SERVICE ELEVATOR SIZE (Minimum for Ambulance Stretchers) See ANSI A17.1.

Inside car size	-	6'-8" wide by 4'-3" deep
Door size	-	3'-6" wide by 7'-8" high
Door type	-	Single slide
Capacity	-	2500 lbs.

615 MECHANICAL

615-1 SPECIAL PIPING SYSTEM

Gas transmission systems shall be installed to obtain at least the level of safety performance required by 49 CFR, Part 192, entitled "Transportation of Natural or Other Gas by Pipeline." Liquid petroleum pipelines shall conform to 49 CFR, Part 195.

- b. When a publicly owned or publicly controlled system is not available or connection to or service therefrom is not feasible, connection shall be made to a community system which complies with HUD Handbook 4940.3 Rev.1-1992 and is acceptable to local regulatory bodies. Evidence of approval by such authorities for each completed system shall be submitted to the HUD Field Office.

APPENDIX A

DEFINITIONS

Abbreviations, terms, phrases and words used in the Minimum Property Standards shall have the meanings given in this Appendix. The following terms are defined for HUD purposes and the definitions may differ from those used in building codes and elsewhere.

COMMUNITY SYSTEM. A state-regulated central utility system owned, operated and maintained by a private corporation or a nonprofit property owner's association.

CONDUCTANCE, THERMAL. The time rate of heat flow through a unit area of a material of a given thickness, per unit of temperature difference. Value is expressed in $\text{Btu}/(\text{hr} \times \text{sq ft} \times \text{F})$ or $\text{w}/(\text{m}^2 \times \text{k})$. (symbol C)

CONDUCTIVITY, THERMAL. The time rate of heat flow through a unit area of a homogenous material under the influence of a unit temperature gradient. Value is expressed in $(\text{Btu} \times \text{in.})/(\text{hr} \times \text{sq ft} \times \text{F})$ or $\text{w}/(\text{m} \times \text{k})$. (symbol k)

HABITABLE ROOM. A room designed (in accordance with the MPS) and used for living, sleeping, eating or cooking, or any combination thereof. Bathrooms, toilet compartments, closets, halls, storage spaces, laundry and utility rooms, basement recreation rooms and similar areas are not considered habitable rooms.

INDEPENDENT INSPECTION AGENCY. Where the term "independent inspection agency" is used in the standards, the reference is to an agency which maintains a program of continuous control, testing and inspection over the quality of the product. Such an agency must conform to procedures set forth in ANSI Z34.1-87, and shall be acceptable to HUD.

LISTED AND LISTING. Terms referring to materials, equipment or products which have been tested to and comply with an applicable standard and which are shown in a list published by a recognized certifying agency.

LIVING UNIT. A single residential unit providing complete, independent living facilities for one or more persons which includes permanent facilities for living, sleeping, eating, cooking and sanitation.

APPENDIX B

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association
ACI	American Concrete Institute
AFPA	American Forest and Paper Association
AHA	American Hardboard Association
ATA	American Institute of Architects
ANSI	American National Standards Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineering
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BOCA	Building Officials and Code Administrators
Btuh	British thermal units per hour
CABO	Council of American Building Officials
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
CPSC	Consumer Product Safety Commission
CRI	Carpet and Rug Institute
CS	Commercial Standard
DOT	Department of Transportation
EO	Executive Order
EPA	Environmental Protection Agency
ext.	Exterior
F	Fahrenheit (degrees)
FHA	Federal Housing Administration
FGMA	Flat Glass Marketing Association
FHDA	Fir and Hemlock Door Association
FS	Federal Specification
ft.	Feet
gals	Gallons
hr	Hour
HUD	Department of Housing and Urban Development
in.	Inches
int.	Interior
ISWA	Insect Screening Weavers Association
lb	Pounds
max	Maximum
min.	Minimum
mph	Miles per hour
MPS	Minimum Property Standards
MR	Materials Release
MS	Manual Series
NAHB-RF	National Association of Home Builders - Research Foundation

B-1

APPENDIX C

MATERIAL STANDARDS

Materials listed in Appendix C are a partial listing of materials considered to meet the minimum requirements of the MPS. The list of approved incorporations by reference is published in the Code of Federal Regulations at 24 CFR Part 200 Appendix A.

507	<u>THERMAL AND MOISTURE PROTECTION</u>
507-3	BUILDING INSULATION
	Cork Board-----FS HH-I-525A
	Cellular Glass-----FS HH-I-551E
	Cellulosic, Vegetable or Wood Fiber-----ASTM C 739-91
	Expanded Polystyrene Insulation Board-----FS HH-I-524C
	Fiberboard-----FS LLL-I-535B
	Class C or E
	or ASTM C 209-84
	Insulation Board (Urethane)-----FS HH-I-530B
	Insulation Board, Thermal
	(Mineral Aggregate)-----FS HH-I-529B
	or ASTM C 726-88
	Insulation Board, Thermal, Faced,
	Polyurethane or
	Polyisocyanurate--FS HH-I-1972/GEN; 1; 2; 3; 4; 5; & 6
	Mineral Fiber, Board (Roof)-----FS HH-I-526C
	Mineral Fiber, Insulation Blanket-----FS HH-I-521F
	Mineral Fiber, Pneumatic or Poured-----FS HH-I-1030B
	Perimeter Insulation-----FS HH-I-524C
	FS HH-I-558B
	Form A
	Class 1 or 2
	Reflective, Thermal-----FS HH-I-1252B
	Cellulosic Fiber Insulating Board-----PS 57-73
	Application of Structural Insulating Board
	(Fiberboard) Sheathing-----ASTM C 846-82
	Perlite-----FS HH-I-574B
	or ASTM C 549-81
	Vermiculite (used as masonry wall filler)---FS HH-I-585C
	Class 2
	(for other uses) --- ASTM C 516-85
	Spray Applied Cellulosic Thermal Insulation--UM 80-79
507-6	CAULKING AND SEALANTS
	Elastomeric Type; Multi-Compound-----FS TT-S-227B
	Elastomeric Type; Single-Compound-----FS TT-S-230A
	Oil and Resin Base Type-----FS TT-C-598B
	Silicone Rubber Base-----FS TT-S-001543A

C-1

Wood Windows and Frames

Wood Window Units-----ANSI/NWMA IS 2-87

Hardware

Lockset-----ANSI A156.2-89
 Insect Wire Screenings-----IWS-089 or CS 138-55
 Screening, Insect, Non-metallic-----FS L-S-125B
 Insect Screening and Louver Cloth
 Woven from Vinyl-Coated Glass
 Fiber Yarn-----ANSI/ASTM D 3656-89

Glass and Other Glazing Panels

Acrylic Plastic Sheets Glazing-----UM 58a-75
 Glass-----FS DD-G-451D

Safety Standard for Architectural
 Glazing Materials-----CPSC 16 CFR
 Part 1201

Safety Glazing Material
 Used In Buildings-----SGCC Certified Products
 Directory

Tempered Glass-----FS-DD-G-1403B

509 FINISH MATERIALS509-1 EXTERIOR WALL FINISHES

Aluminum-----AAMA 1402-86
 Fiberboard Shingle Backer-----ASTM C 208-82
 (1982) Class G
 Basic Hardboard (Revised 1988)-----ANSI/AHA A135.4-82
 Cellulosic Fiberboard-----ANSI/AHA 1-194.1-95
 Hardboard Siding-----ANSI/AHA 135.6-90
 Plywood-----PS 1-83
 Rigid PVC (polyvinyl chloride)-----ASTM D 3679-92
 Textured Plywood Panel Siding-----UM 64b-75
 Stucco (exterior plaster)-----ASTM C 926-90

509-2 FINISH FLOORING-RIGIDCeramic Tile-----ANSI A137.1-88

Specification for Installation
 of Ceramic Tile-----ANSI A108.1A-92
 Terrazzo-----NTMA Specifications, Details and
 Technical Data - 1990

APPENDIX D

TEST PROCEDURES AND PERFORMANCE CRITERIA

Appendix D is a partial list of the testing procedures and performance criteria required by the Minimum Property Standards.

500 GENERAL

A WALL ASSEMBLIES AND SHEATHING MATERIALS - RESISTANCE TO RACKING

A-1 Test Procedures. Test of Walls shall be conducted in accordance with ASTM E 72-80, "Standard Methods of Conducting Strength Test of Panels for Building Construction." Panel size shall be 8 ft by 8 ft.

A-2 Performance Criteria. The following criteria shall apply:

a. Dry Tests

```

Load increments-----400 lb
Maximum load-----5200 lb or 0.65 kips/ft
At load of-----1200 lb average total
                    deflection 0.20 in.
                    Residual deflection 0.10 in.
At load of-----2400 lb average total
                    deflection 0.60 in.
                    Residual deflection 0.30 in.

```

b. Wet Tests

```

Load increments-----400 lb
Maximum load-----4000 lb or 0.50 kips ft
At load of-----1200 lb average total
                    deflection 0.28 in.
                    Residual deflection 0.14 in.
At load of-----2400 lb average total
                    deflection 0.80 in.
                    Residual deflection 0.40 in.

```

C WINDOWS AND SLIDING GLASS DOORS - PHYSICAL LOAD

C-1 Test Procedure Physical load tests shall be conducted in accordance with ASTM E 330-90.

C-2 Performance Criteria

a. Minimum Performance

- (1) Under a uniform load of 10 psf applied to surface of unit, except jalousie windows and sliding glass doors, max. deflection of any member shall not exceed 1/175 of its span.
- (2) Under a uniform load of 20 psf applied for 10 seconds to the ext., then a uniform load of 10 psf applied to the int. for 10 seconds, there shall be no glass breakage, damage to hardware or residual deflection.

b. In areas subject to winds 90 mph and over, the uniform loads, shown in a. (2) may be increased to 40 psf exterior and 20 psf interior loadings, at the discretion of the HUD Field Office.

APPENDIX E

ACCEPTED ENGINEERING PRACTICE STANDARDS

Design and construction completed in accordance with the applicable standards, guides and recommendations contained in this Appendix shall be considered to satisfy the requirements of the MPS, unless stated otherwise. The list of approved incorporations by reference is published in the ' Code of Federal Regulations at 24 CFR Part 200 Appendix A.

100-1 DISABLED PERSONS

Uniform Federal Accessibility Standards (UFAS)-----
-----GSA, DOD, HUD, AND USPS 24 CFR Part 40

600 GENERAL

Intermediate Minimum Property Standards
Supplement - Solar Heating and Domestic
Hot Water Systems-----HUD Handbook, 4930.2-1989

602 SITE

Thickness Design - Full Depth Asphalt Pavement
Structures for Highways and Streets - Asphalt
Institute-----MS-1-1981
Installing Vitrified Clay
Sewer Pipe-----ASTMC 12-91
Test for Moisture - Density
Relation of Soil-----ASTM D 1557-91
Installing Bituminized Fiber
Drain & Sewer Pipe-----ASTM D 2316-84
Floodplain Management-----EO 11988
Protection of Wetlands-----EO 11990

603 CONCRETE

Recommended Practice for Selecting Proportions for
Concrete-----ACI 211.1-89
Recommended Practice for Selecting
Proportions for Structural Lightweight
Concrete-----ACI 211.2-91
Guide for Structural Lightweight
Concrete-----ACI 213R-87

Manual for Quality Control
for Plants and Production
of Precast Prestressed
Concrete Products-----PCI MNL-116-85
Manual of Quality Control
for Plants and Production
Architectural Precast
Concrete Products-----PCI MNL-117-77
Code for Welding in Building
Construction-----ANSI/AWS D1.1-90
Recommended Practices for
Welding Reinforcing
Steel, Metal Inserts and
Connection in Reinforced
Concrete Construction-----AWS D1.4-79
Manual for Structural
Design of Architectural
Precast Concrete-----PCI MNL-121-77

606

WOOD AND PLASTICS

Wood Decay in Houses - How to Prevent
and Control It-----USDA Home and Garden
Bulletin No. 73-1986
Wood Frame House Handbook-----USDA Agriculture
Handbook No. 73-1989
Subterranean Termites Their
Prevention and Control in
Buildings-----USDA Home and Garden
Bulletin No. 64-1989
Wood Construction-----National Design
Specification 1991
Edition including
amendments
Standard for Plastic
Toilets Seats
(Water Closet Seats)-----ANSI Z 124.5-1989

607

THERMAL AND MOISTURE PROTECTION

Model Energy Code-----CABO 1992 Edition
Insulation Manual, Homes-Apartments-----NAHB-RF-1979
Handbook of Applications-----ASHRAE-1987
Handbook of Equipment-----ASHRAE-1988
Handbook of Systems-----ASHRAE-1980
Handbook of Fundamentals-----ASHRAE-1989
Cooling and Heating Load Calculations
Manual-----ASHRAE GRP 158-1979
Window and Sliding Glass

E-3

1994

- 611 EQUIPMENT
- 611-1 KITCHEN CABINETS
- Recommended Minimum Construction
 and Performance Standards for
 Kitchen and Vanity
 Cabinets-----ANSI A 161.1-86
- Certified Construction
 Standards and
 Specifications-----SCACM-73
- 611-2 KITCHEN EQUIPMENT
- National Fuel Gas Code-----NFPA 54-92 (ANSI Z223.1)
 Electrical Appliance and
 Utilization Equipment
 Directory-----UL-1992
- 615 MECHANICAL
- 615-7 SPECIAL PIPING SYSTEMS
- Standards-----NFPA 54-92
- Standard for the Storage
 and Handling of Liquified
 Petroleum Gases-----ANSI Z 223.1/NFPA 58-1992
- 615-8 WATER SUPPLY
- Drinking Water Standards
- National Interim Primary
 Drinking Water Regulations-----EPA 40 CFR 141
- Manual of Individual Water
 Supply Systems-----EPA 570/9-82-004
- 615-9 SEWAGE DISPOSAL SYSTEMS
- HUD Handbook 4940.3-Rev.1-92
- Installing Vitrified
 Clay Pipe Sewers-----ASTM C 12-91
- Underground Installation
 of Flexible Thermoplastic
 Sewer Pipe-----ASTM D 2321-89

APPENDIX F

USE OF MATERIALS BULLETINS

Appendix F is a partial list of Use of Materials Bulletins describing products and methods which are not included in the standard but which have been found to be technically suitable for use in HUD programs. For a complete listing of UM Bulletins, See HUD Handbook 4950.1

507 THERMAL AND MOISTURE PROTECTION

Polystyrene Foam Insulation
 Board-----No. UM-71a-93
 Spray Applied Cellulosic Thermal
 Insulation-----No. UM-80-79

508 DOORS, WINDOWS, GLAZING PANELS

Aluminum Fenestration Products-----No. UM-39b-93
 Plywood, Grademarking-----No. UM-40c-90
 Wood Flush Doors-----No. UM-52a-75
 Acrylic Plastic Sheets for Glazing-----No. UM-58a-75
 Wood Fenestration Products-----No. UM-59b-93
 Polycarbonate Plastic
 Sheets for Glazing-----No. UM-67-75
 PVC Plastic Fenestration Products-----No. UM-85a-93
 Exterior Insulated Steel Door Systems-----No. UM-89-93
 Solar Water Heater Systems-----No. UM-100-93

509 FINISH MATERIALS

Concrete Roofing Tile-----No. UM-17e-74
 Carpet-----No. UM-44d-93
 Textured Plywood Panel Siding-----No. UM-64b-75
 Factory-Applied Laminated
 Roofing Systems Based
 on Chlorosulfonated
 Polyethylene (CSPE)-----No. UM-62a-72
 Controlled Density Cellular
 Concrete
 Floor Fill-----No. UM-65-73
 Carpet Cushion-----No. UM-72a-93

APPENDIX G

SI Conversion Units

In view of the present accepted practice in this country for building technology, common U. S. units of measurement have been used throughout this publication. In recognition of the Metric Conversion Act of 1975, P. L. 94-168, appropriate conversion factors have been provided in the table below. The reader interested in making further use of the coherent systems of SI units is referred to: The Metric Guide for Federal Construction, First Edition as Published by the National Institute of Building Sciences.

Table of Conversion Factors to Metric (SI) Units

Physical Quality	To Convert From	To	Multiply By
Length	inch	meter	2.54×10^{-2}
	foot	m	3.048×10^{-2}
Area	inch ²	m ²	6.4516×10^{-4}
	foot ²	m ²	$.290 \times 10^{-3}$
Volume	inch ³	m ³	1.639×10^{-5}
	foot ³	m ³	2.832×10^{-2}
Temperature	Fahrenheit	Celsius	$t_c = (F-32)/1.8$
Temperature difference	Fahrenheit	Kelvin	$K = (°F)/1.8$
Pressure	inch Hg (60°F)	newton/m ²	3.377×10^3
Mass	lbm	kg	4.536×10^{-1}
Mass/unit area	lbm/ft ²	kg/m ²	4.882
Moisture content rate	lbm/ft ² week	kg/m ² s	8.073×10^{-6}
Density	lbm/ft ³	kg/m ³	1.602×10^{-1}
Thermal conductivity	(Btu x in)/(hr x ft ² x F)	$\frac{W}{mK}$	1.422×10^{-1}
U-value	Btu/hr x ft x F	$\frac{W}{m^2K}$	5.678
Thermal resistance	(hr x ft x F)/Btu	m ² x K/W	$1/761 \times 10$

*Exact value; others are rounded to the minimum number of significant units.

APPENDIX H

MINIMUM PROPERTY STANDARDS REFERENCE SOURCES

This Appendix gives the addresses from which the standards referenced in the Minimum Property Standards can be obtained.

<u>Abbreviation</u>	<u>Address</u>
AA	Aluminum Association, Inc. 900 19th Street, NW, Suite 300 Washington, DC 20006
AAMA	American Architectural Manufacturers Association 1540 East Dundee Road, Suite 310 Palatine, IL 60067
ACI	American Concrete Institute 22400 W. Seven Mile Road Detroit, Michigan 48219
AFPA	American Forest & Paper Association 1111 19th Street, NW; Suite 800 Washington, DC 20036
AHA	American Hardboard Association 1210 W. Northwest Highway Palatine, IL 60067
AIA	American Institute of Architects 1735 New York Ave., NW Washington, DC 20006
ANSI	American National Standards Institute 11 West 42nd Street New York, NY 10036
ARMA	Asphalt Roofing Manufacturers Association 6288 Montrose Road Rockville, MD 20852
ASCE	American Society of Civil Engineers 345 E 47th Street New York, NY 10017
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE, Atlanta, GA 30329

H-1

FHDA Fir and Hemlock Door Association
 Yeon Building
 Portland, OR 97204

FS Department of Defense
 Naval Publication and Forms Center
 5801 Taber Road
 Philadelphia, PA 19120

HPVA Hardwood Plywood and Veneer Association
 1825 Michael Faraday Drive
 Reston, VA 22090

HUD Department of Housing and Urban Development
 451 Seventh Street, SW
 Attention: Mail Room B-133
 Washington, DC 20410

ISWA Insect Screening Weavers Association
 2000 Maple Hill Street
 P. O. Box 309
 Yorktown Heights, NY 10598

KCMA Kitchen Cabinet Manufacturers Association
 1819 Preston White Drive
 Reston, VA 22091

MS Asphalt Institute
 Asphalt Institute Building
 College Park, MD 20740

NASB-RF National Association of Home Builders -
 Research Center
 400 Prince Georges Boulevard
 Upper Marlboro, MD 20772

NAIMA North American Insulation Manufacturers Association
 1420 King Street
 Alexandria, VA 22314

NAS National Academy of Sciences
 2101 Constitution Avenue, NW
 Washington, DC 20418

NCDC National Climatic and Data Center
 Federal Building
 Asheville, NC 28801-2696

PTI Post-tensioning Institute
301 West Osborn
Suite 3500
Phoenix, AZ 85013

RFCI Resilient Floor Covering Institute
966 Hungerford Drive, Suite 12-B
Rockville, MD 20850

SCACM Southern California Association of
Cabinet Manufacturers
1933 South Broadway, L. 39
Los Angeles, CA 90007

SGCC Safety Glazing Certification Council
c/o ETL Testing Laboratories
Industrial Park, Route 11
Cortland, New York 13045

SDI Steel Door Institute
30200 Detroit Road
Cleveland, OH 44145

TAI The Asphalt Institute
Asphalt Institute Building
College Park, MD 20740

TCA Tile Council of America, Inc.
Box 326
Princeton, NJ 08542

UL Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062

UM Use of Materials Bulletin

USDA Department of Agriculture
Publications Division
14th and Independence Avenue, SW
Washington, DC 20050

WM Wood Moulding and Millwork Producers
P. O. Box 25278
Portland, OR 97225

WQA Water Quality Association
4151 Naperville Road
Lisle, IL 60532

H-5

APPENDIX I24 C.F.R 200.925a-c
Rules for Multifamily and Care-Type Housing

The following portions of 24 C.F.R Part 200 have been included for the convenience of the users of this handbook. These provisions established procedures relating to the use of local or model codes in conjunction with the standards contained in this handbook.

§200.925a Multifamily and care-type minimum property standards.

- (a) Construction Standards. Multifamily or care-type properties shall comply with the minimum property standards contained in the handbook identified in §200.929(b)(2). In addition, each such property shall, for the Department's purposes, comply with:
- (1) The applicable state or local building code, if the property is located within a jurisdiction which has a building code accepted by the Secretary under §200.925(d); or
 - (2) (i) The applicable State or local building code, and
(ii) Those portions of the codes identified in 200.925c which are designated by the HUD Field Office serving the jurisdiction in which the property is to be located, if the property is located in a jurisdiction which has a building code partially; accepted by the Secretary; or
 - (3) The appropriate codes, as identified in §200.925c(c), if the property is not located within a jurisdiction which has a building code accepted by the Secretary.
- (b) Conflicting Standards. The minimum property standards contained in the handbook identified in §200.929(b)(2) do not preempt State or local standards, nor do they alter or affect a builder's obligation to comply with any State or local requirements. However, a property shall be eligible for benefits only if it complies with all applicable minimum property standards, including referenced standards.

- (A) The developer or other interested party may choose to comply with the appropriate codes as identified in §200.925c. If the developer or other interested party so chooses, then the multifamily or care-type property shall be constructed in accordance with one of the model codes designated in subparagraph (c) (1), (2) or (3) of §200.925c and with any other code or codes identified in the same paragraph. In such instances, the developer or other interested party shall notify the Department of the code or group of codes with which it intends to comply by the time of application for insurance or other benefits; or
- (B) The developer or other interested party may choose to comply with the State or local building code, if such code is acceptable to the Secretary. To obtain the Secretary's acceptance, the developer or other interested party shall submit the material specified in §200.925a(d)(1)(ii) to the HUD Field Office serving the jurisdiction in which the property is to be constructed. Such material may be submitted at any time provided, however, that it must be submitted no later than the time of application for mortgage insurance or other benefits.
- (ii) If, under §200.925a(d)(1)(i)(B), the developer or other interested party chooses to comply with the State or local building codes as prescribed in §200.925a(a)(1), it shall submit the following material to the HUD Field Office serving the jurisdiction in which the property is to be constructed:
 - (A) A copy of the jurisdiction's building code, including all applicable service codes, appendices and referenced standards;

- (3) Notification of Decision. The Secretary shall review the material submitted under §200.925a(d)(1)(ii) and §200.925a(d)(2)(i). Following that review, the Secretary shall issue a written notice (except in the case of a previously accepted code which hasn't been changed) to the submitting party stating whether a State or local building code has been accepted, partially accepted, or whether the Secretary's previous acceptance or partial acceptance has been continued; the basis for the Secretary's decision; and a notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his discretion, permit either an oral or written presentation of views.

- (i) If a developer or other interested party is notified that a State or local building code has not been accepted, then the multifamily or care-type properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with appropriate codes indicated in §200.925c(c). In such instances, the developer or other interested party shall notify the HUD Field Office of the code or codes with which it chooses to comply, in accordance with §200.925a(d)(1)(i)(A).

- (ii) If a developer or other interested party is notified that a State or local building code has been partially accepted, the multifamily or care-type properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified in the written notice issued by the Secretary under §200.925a(d)(3). The written notice shall identify, in accordance with Appendix J of the Handbook identified in §200.929 (b)(2), those portions of the codes listed at §200.925c(a) with which the property must comply.

(d) Foundation systems.

- (1) Soil test;
- (2) Foundation depths;
- (3) Footings;
- (4) Foundation materials criteria;
- (5) Piles, i.e., materials, allowable stresses, design;
- (6) Excavation.

(e) Materials standards.

(f) Construction components.

- (1) Steel;
- (2) Masonry;
- (3) Concrete;
- (4) Gypsum;
- (5) Lumber;
- (6) Roof construction and covering;
- (7) Chimneys and fireplaces.

(g) Glass.

- (1) Thickness/area requirements;
- (2) Safety glazing.

(h) Mechanical.

- (1) Heating, cooling and ventilation systems;
- (2) Boilers and pressure vessels;
- (3) Gas, liquid and solid fuel piping and equipment;
- (4) Chimneys and vents;
- (5) Ventilation (air changes).

(i) Plumbing.

- (1) Materials standards;
- (2) Sizing and installing drainage systems;
- (3) Vents and venting;
- (4) Traps;
- (5) Cleanouts;
- (6) Plumbing fixtures;
- (7) Water supply and distribution;
- (8) Storm drain systems.

- (ii) The Southern Standard Building, Plumbing, Mechanical and Gas Code, 1991 Editions including the 1992 and 1993 to the building code and the 1992 revisions to the Gas and Mechanical Codes, but excluding Chapter 1 - Administration from each code and the phrase "or fire retardant treated wood" in reference note (a) of table 600 Chapter 6 of the Building Code but including Appendices A, C, E, J, K, M and R. Available from the Southern Building Code Congress International, Inc., 900 Montclair Road, Birmingham, AL 35213.
- (iii) Uniform Building Code, 1991 Edition including the 1993 Accumulative Supplement, but excluding Part I - Administrative, and the reference to fire retardant treated plywood in Section 2504(c)3 and to fire retardant treated wood in 1 - HR type III and V construction referenced in paragraph 4203.2., but including the Appendix of the Code. Uniform Plumbing Code, 1991 Edition, including the 1992 Code Changes but excluding Part I - Administration, but including the Appendices of the Code. Uniform Mechanical Code, 1991 Edition, including the 1993 Accumulative Supplement but excluding Part I - Administrative, but including the Appendices of the Code. All available from the International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, CA 90601.
- (2) National Electrical Code, NFPA 70, 1993 Edition, including the appendices. Available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
- (3) National Standard Plumbing Code, 1993 Edition, including appendices. Available from the National Association of Plumbing - Heating - Cooling Contractors, P. O. Box 6808, Falls Church, VA 22046.

APPENDIX J

Model Code Provisions for Use in Partially
Accepted Code Jurisdictions

If a developer or other interested party is notified that a State or local building code has been partially accepted, then the multifamily and care-type properties eligible for HUD benefits in that justification shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified in the written notice issued by the Secretary under 24 CFR §200.925a(d)(3).

Depending upon the major area which is not fully regulated by the local code, the HUD Field Office will designate, in accordance with the schedule below, those portions of one of the model codes with which the property must comply. The HUD Field Office is responsible for selecting the particular model code from which the portions are taken.

APPENDIX K

24 CFR 200.926

Minimum Property Standards for Property which is not
Multifamily or Care-type Property

The following portions of 24 C.F.R. Part 200 have been included for the convenience of the users of this handbook. These provisions establish procedures for the construction of one and two family dwellings and reference standards found in the Appendices of this handbook.

§ 200.926 Minimum property standards for one- and two-family dwellings.

(a) Construction standards.

- (1) Applicable structures. The standards identified or contained in this section and §§200.926 and 200.926a-200.926e shall apply to single family detached homes, duplexes, triplexes and to living units in a structure where the units are located side-by-side in townhouse fashion.
- (2) Applicability of standards to new construction. The standards referenced in paragraph (a)(1) of this section are applicable to:
 - (i) Structures approved for insurance or other benefits prior to the start of construction, including approval under the direct endorsement process described in §203.5 of this chapter;
 - (ii) Structures which are approved for insurance or other benefits based upon participation in an insured warranty program;
 - (iii) Structures which are insured as new construction based upon a Certificate of Reasonable Value issued by the Veterans Administration.

- (i) In jurisdictions without local building codes:
 - (A) If the State building code is acceptable, the lender or other interested party must comply with the State building code and the requirements of §200.926d;
 - (B) If the State building code is partially acceptable, the lender or other interested party must comply with:
 - (1) The acceptable portions of the partially acceptable code;
 - (2) Those portions of the CABO One-and Two-Family Dwelling Code or the Electrical Code for One-and Two-Family Dwellings, designated by the HUD Field Office, in accordance with §200.926c; and
 - (3) The requirements of §200.926d.
 - (C) If there is no State building code or if the State building code is unacceptable, the lender or other interested party may comply with:
 - (1) The CABO One-and Two-Family Code and the Electrical Code for One-and Two-Family Dwellings, as identified in §200.926b(a); and
 - (2) The requirements of §200.926d.
- (ii) In jurisdictions with local building codes which have never been submitted for review, lenders or other interested parties must:
 - (A) Comply with the requirements of §200.926(d)(1)(i)(A), (B) or (C), as appropriate; or
 - (B) Request the Secretary's acceptance of the local building code in accordance with §200.926(d)(1)(iv).

appendices and a copy of the statute, ordinance, regulation or order making such changes in the code, which have been made since the date when the code or other changes thereto were last submitted to the Secretary. However, the lender or other interested party need not submit any part already in the possession of the HUD Field Office. Based upon the Secretary's determination concerning the acceptability of the local code as changed, the lender or other interested party must comply with the requirements of \$200.926(d)(1)(ii)(B)(1), (2) or (3), as appropriate.

- (iv) In order to obtain the Department's approval of a local code, the lender or other interested party must submit the following material to the HUD Field Office serving the jurisdiction in which the property is to be constructed:

- (A) A copy of the jurisdiction's local building code, including all applicable service codes and appendices; and
- (B) A copy of the statute, ordinance, regulation, or order establishing the code, if such statute, ordinance, regulation or order is not contained in the building code itself. However, the lender or other interested party need not submit any document already on file in the HUD Field Office.

(2) Jurisdictions with previously accepted or partially accepted building codes.

- (1) The lender or other interested party shall submit to the HUD Field Office serving the jurisdiction in which the property is to be constructed:

- (A) A certificate stating that since the date when the code or any changes thereto were last submitted to the Secretary, the jurisdiction's local building code has not been changed; or

- (3) Notification of decision. The Secretary shall review the material submitted under §200.926(d). Following that review, the Secretary shall issue a written notice (except where there is a previously accepted or partially accepted code which has not been changed) to the submitting party stating whether local building code is acceptable, partially acceptable or not acceptable. Where the local building code is not acceptable, the notice shall also state whether the State code is acceptable, partially acceptable or not acceptable. The notice shall also contain the basis for the Secretary's decision and a notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his discretion, permit either an oral or written presentation of views.

(1) Fire retardant treated plywood, where approved by a State or local building code, shall not be permitted for use in roof construction unless a HUD technical suitability bulletin has been issued by the Department for that product.

(ii) The Secretary shall review the material submitted under 200.926(d). Following that review, the Secretary shall issue a written notice (except where there is a previously accepted or partially accepted code which has not been changed) to the submitting party stating whether the local building code is acceptable, partially acceptable or not acceptable. Where the local building code is not acceptable, the notice shall also state whether the State code is acceptable, partially acceptable or not acceptable. The notice shall also state the basis for the Secretary's decision and a notification of the submitting party's right to present its views concerning the denial of acceptance if the code is neither accepted nor partially accepted. The Secretary may, in his or her discretion, permit either an oral or written presentation of views.

(c) Structural loads.

- (1) Design live loads;
- (2) Design dead loads;
- (3) Snow loads (for jurisdiction with snow loading conditions identified in Section 7 of ASCE-7-88 (Formerly ANSI A58.1))
- (4) Wind loads; Use ASCE-7-88
- (5) Earthquake loads (for jurisdictions in seismic zones 3 or 4 as identified in Section 9 of ASCE-7-88 (Formerly ANSI A58.1))

(d) Foundation systems.

- (1) Foundation depths;
- (2) Footings;
- (3) Foundation materials criteria.

(e) Materials standards.

- (1) Materials standards.

(f) Construction components.

- (1) Steel;
- (2) Masonry;
- (3) Concrete;
- (4) Lumber;
- (5) Roof construction and covering;
- (6) Chimneys and fireplaces.

(g) Glass.

- (1) Thickness/area requirements;
- (2) Safety glazing.

(h) Mechanical.

- (1) Heating, cooling and ventilation systems;
- (2) Gas, liquid and solid fuel piping and equipment;
- (3) Chimneys and vents;
- (4) Ventilation (air changes).

(b) Model code compliance requirements.

- (1) When a one or two family dwelling is to comply with the model codes set forth in §200.926(a), the following requirements of those model codes shall not apply to those properties:

- (i) Those provisions of the model codes that require or allow the issuance of permits of any sort.

- (2) Where the model codes set forth in §200.926b(a) designate a building, fire, mechanical, plumbing or other official, the Secretary's designee in the HUD Field Office serving the jurisdiction in which the dwelling is to be constructed shall act as such officials.

(c) Designation of Model Codes. When a one or two family dwelling or townhouse is to comply with portions of the model code or the entire code, the dwelling shall comply with the CABO One and Two Family Dwellings Code 1992 Edition, including the 1993 amendments but excluding Chapter I - Administration, or portions thereof as modified by §200.926d(e) of this part and designated by the HUD Field Office serving a jurisdiction in which the property is located. In addition, the property shall comply with all the standards which are referenced for any designated portions of the model code, and with the Electrical Code for One and Two Family Dwellings, NFPA 70A, 1990.

- (1) CABO One and Two Family Dwelling Code, 1992 Edition with the 1993 amendments.
- (2) Electrical Code for One and Two Family Dwellings, NFPA 70A, 1990.

§ 200.926C Model code provisions for use in partially accepted code jurisdictions.

If a lender or other interested party is notified that a State or local building code has been partially accepted, then the properties eligible for HUD benefits in that jurisdiction shall be constructed in accordance with the applicable State or local building code, plus those additional requirements identified below. Depending upon the major area identified in §200.926a which is not adequately regulated by the State or local code, the HUD Field Office will designate, in accordance with the schedule below, those portions of one of the model codes with which the property must comply.

(2) Requirements for Accessibility to Physically Disabled People

The HUD Field Office will advise project sponsors as to the extent accessibility will be required for new construction of one- and two-family dwellings on a project-by-project basis.

(1) Technical Standards

See HUD, Minimum Property Standards, 4910.1 See 24 CFR Part 40.

(3) Variations to standards.

(i) New materials and technologies.

See § 200.926d(d). Alternatives, nonconventional or innovative methods and materials shall be equivalent to these standards in the areas of structural soundness, durability, economy of maintenance or operation and usability.

(ii) Variation procedures.

Variations from the requirements of any standard with which the Department requires compliance shall be made in the following ways:

- (A) For a particular design or construction method to be used on a single case or project, the decision is the responsibility of the Field Office. Headquarters concurrence is not required.
- (B) Where a variation, is intended to be on a repetitive basis, a recommendation for a Local Acceptable Standard, substantiating data, and background information shall be submitted by the Field Office to the Director, Office of Manufactured Housing and Regulatory Functions.
- (iii) Variances which require individual analysis and decision in each instance are not considered as repetitive variances even though one particular standard is repeatedly the subject of variation. Such variances are covered by §200.926d(a)(3)(ii)(A).

shall not pass over, under or through any other living unit. Individual utilities serving a living unit may not pass over, under or through another living unit under the same mortgage unless provision is made for repair and maintenance of utilities without trespass or when protected by an easement of covenant providing permanent access for maintenance and repair of the utilities. Building drain cleanouts shall be accessible from the exterior where a single drain line within the building serves more than one unit.

(3) Site conditions.

- (i) The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of the occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, potential damage from soil or other differential ground movements, ground water, inadequate surface drainage, flood, erosion, or other hazards located on or off site. The site must meet the standards set forth at 24 CFR Part 51, and HUD Handbook 4910.1, Section 606 for termite and decay protection.
- (ii) When special conditions exist or arise during construction which were unforeseen and which necessitate precautionary or hazard mitigation measures, the HUD Field Offices shall require corrective work to mitigate potential adverse effects from the special conditions as may be necessary. Special conditions include rock formations, unstable soils or slopes, high ground water level, springs, or other conditions which may adversely affect a property. It shall be the builder's responsibility to assure proper design, construction and satisfactory performance where they are present.

- (ii) Streets shall be designed for dedication for public use and maintenance or, when approved by the HUD Field Office, may be retained as private streets where protected by permanent easements.

(3) Dedication.

Utilities shall be located to permit dedication to the local government or appropriate public body.

(4) Drainage and flood hazard exposure.

- (i) Residential structures with basements located in FEMA-designated areas of special flood hazard. The elevation of the lowest floor in structures with basements shall be at or above the base flood level (100 year flood level) required for new construction or substantial improvement of residential structures under regulations for the National Flood Insurance Program (NFIP) (see 44 CFR 60.3 through 60.6), except where variances from this standard are granted by communities under the procedures of the Federal Emergency Management Agency (FEMA) at 44 CFR 60.6(a) or exceptions from this NFIP standard for basements are approved by FEMA in accordance with procedures at 44 CFR 60.6(c).
- (ii) Residential structures without basements located in FEMA-designated areas of special flood hazard. The elevation of the lowest floor in structures without basements shall be at or above the FEMA-designated base flood elevation (100 year flood level).
- (iii) Residential structures located in FEMA-designated "coastal high hazard areas". (A) Basements or any permanent enclosure of space below the lowest floor of a structure are prohibited.

(B) Where FEMA has determined the base flood level without establishing stillwater elevations, the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) and its horizontal supports shall be at or above the base flood level.

K-17

(2) Non-structural or non-standard features.

These features include methods of construction, systems, sub-systems, components, materials and processes which are not covered by these requirements. See HUD Handbook 4950.1 for procedures to be followed in order to obtain acceptance of non-structural components or materials. See HUD Handbook 4910.1 Appendix F for a list of Use of Materials Bulletins. Products and methods shall conform to the appropriate Use of Materials Bulletin.

(3) Standard features.

These features include methods of construction, systems, sub-systems, components, materials and processes which are covered by national society or industry standards. For a list of standards to which compliance is required, see HUD Handbook 4910.1, Appendices C, E and F.

(e) Energy efficiency

All detached One and Two Family Dwellings and One Family Townhouses not more than three stories in height shall comply with the CABO Model Energy Code, 1992 Edition, Residential Buildings, except for Sections 101.3.1, 101.3.2, 104 and 105, but Section 101.3.2.2, Historic Buildings, shall remain, and including the Appendix, and HUD Intermediate MPS Supplement 4930.2 Solar Heating and Domestic Hot Water Systems, 1989 edition.

(f) Water supply systems.(1) General.

- (i) Each living unit shall be provided with a continuing and sufficient supply of safe water under adequate pressure and of appropriate quality for all household uses. Newly constructed residential property for which a building permit has been applied for on or after June 19, 1988 from the competent authority with jurisdiction in this matter shall have lead-free water piping. For

(3) Location of wells.

- (i) A well located within the foundation walls of a dwelling is not acceptable except in arctic or subarctic regions.
- (ii) Water which comes from any soil formation which may be polluted, contaminated, fissured, creviced or less than 20 ft. below the natural ground surface is not acceptable, unless acceptable to the local health authority.
- (iii) Individual water supply systems are not acceptable for individual lots in areas where chemical soil poisoning has been or is practiced if the overburden of soil between the ground surface and the water bearing strata is coarse grained sand, gravel, or porous rock, or is creviced in a manner which will permit the recharge water to carry the toxicants into the zone of saturation.
- (iv) The following table shall be used in establishing the minimum acceptable distances between wells and sources of pollution located on either the same or adjoining lots. These distances may be increased by either the health authority having jurisdiction or the HUD Field Office.

- (B) The casing shall extend from a point several feet below the water level at drawdown or from an impervious strata above the water level to 12 in. above either the ground surface of the pump room floor. The casing shall be sealed at the upper opening to a depth of at least 15 feet.
- (iii) Bored wells shall be lined with concrete, vitrified clay or equivalent materials.
- (iv) The space between the casing or liner and the wall of the well hole shall be sealed with cement grout.
- (v) The well casing shall not be used to convey water except under positive pressure. A separate drop pipe shall be used for the suction line.
- (vi) When sand or silt is encountered in the water-bearing formation, the well shall either be compacted and gravel packed, or a removable strainer or screen shall be installed.
- (vii) The surface of the ground above and around the well shall be compacted and graded to drain surface water away from the well.
- (viii) Openings in the casing, cap, or concrete cover for the entrance of pipes, pumps or manholes shall be water tight.
- (ix) If a breather is provided, it shall extend above the highest level to which surface water may rise. The breather shall be watertight, and the open end shall be screened and positioned to prevent entry of dust, insects, and foreign objects.

- (b) Roof snow load. The roof snow load shall be in accordance with Section 7 of ASCE 7-88 (Formerly ANSI A58.1).
- (c) Wind pressures. The minimum Design Wind Pressures (net pressures) set forth below apply to areas designated as experiencing basic wind speeds up to and including 80 mph, as shown in ASCE 7-88, Figure 1, Basic Wind Speed Map. These pressures also apply to buildings not over 30 ft. in height above finish grade, assuming exposure C or defined in ASCE 7-88 (Formerly ANSI A58.1).
- (1) Minimum design wind pressure criteria.
- (i) Buildings (for overturning, racking or sliding); $p = 20$ psf.
 - (ii) Chimneys, $p = 30$ psf.
 - (iii) Exterior walls, $p = 15$ psf inward or outward. Local pressure at corners of walls shall be not less than $p = 30$ psf outward. These local pressures shall not be included with the design pressure when computing overall loads. The pressures shall be applied perpendicularly outward on strips of width equal to 10 percent of the least width of building.
 - (iv) Partitions, $p = 10$ psf.
 - (v) Windows, $p = 20$ psf inward or outward.
 - (vi) Roof, $p = 20$ psf inward or outward.

Roofs with slopes greater than 6 in 12 shall be designed to withstand pressures acting inward normal to the surface, equal to the design wind pressure for exterior walls. Overhanging eaves, cornices, and ridges, 40 psf upward normal to roof surface. These local pressures shall not be included with the design pressure when computing overall loads. The pressures shall be applied perpendicularly outward on strips of width equal to 10 percent of the least width of building. Net uplift on horizontal projection or roof shall not be less than 12 psf.

INDEX

A

	Section	Page
Abbreviations	Appendix B	
Accepted Engineering Practice		
Standards -----	Appendix E	
Access		
Building and Nondwelling		
Facilities -----	204-2	2-4
Living Unit Doors -----	402-1.1	4-3
Streets -----	204-1	2-4
Acceptability		
General -----	200	2-3
Materials -----	500-1	5-3
Aluminum		
Doors -----	508-2.2	5-4
Windows -----	508-4.3	5-5
Application of Standards -----	100	1-3
Attic		
Ventilation -----	403-1	4-5

B

Base Course, Material		
Concrete Slab -----	603-1.2	6-4
Bathrooms		
Central -----	100-2.4	1-5
		1-6
Building Design		
Access and Circulation -----	402	4-3
Baths -----	401-2	4-3
Elevators -----	402-3	4-4
Ventilation -----	403	4-5

E

	Section	Page
Elderly, Housing for		
Accessibility of Bed -----	100-2.5	1-6
Bathrooms -----	100-2.6	1-6
Central Bathing -----	100-2.4	1-5
Central Dining -----	100-2.4	1-5
Central Kitchen -----	100-2.4	1-5
Combined Spaces, Furnishability -----	100-2.5	1-6
Community Social Rooms -----	100-2.3	1-4
Dietitian's Office -----	100-2.4	1-4
Elevators -----	100-2.9	1-7
Emergency Call System -----	100-2.20	1-9
Emergency Lighting -----	100-2.10	1-7
First Aid Room -----	100-2.4	1-4
Flame Spread Ratings -----	100-2.11	1-7
Floors -----	100-2.13	1-7
Hall -----	100-2.7	1-6
Handrails, Exterior -----	100-2.1	1-3
Heating Design Temperature -----	100-2.14	1-8
Heating System -----	100-2.15	1-8
Medical Facilities -----	100-2.4	1-5
Night Light Outlet -----	100-2.19	1-9
Nursing Facilities -----	100-2.4	1-4
Occupational Therapy -----	100-2.4	1-4
Optional Project Facilities -----	100-2.4	1-4
Stairs -----	100-2.8	1-7
Values, Nonscald -----	100-2.17	1-8
Walks -----	100-2.2	1-4
Wall Finishes -----	100-2.12	1-7
Water Heating, Quantity -----	100-2.18	1-8
Water, Hot and Cold -----	100-2.16	1-8
Elevators -----	402-3	4-4
Required Service -----	402-3.1	4-4
Size -----	614-1	6-15
Existing Construction -----	100-5	1-10
Exterior Painting (See Painting)		
Exterior Walls		
Materials -----	509-1	5-6

I

	Section	Page
Insulation, Thermal (Building)		
Construction -----	607-1.1	6-5
Materials -----	507-1	5-3

K

Kitchen		
Cabinets -----	611-1	6-13
Central -----	100-2.4	1-5

L

Land Use		
Noise Control -----	302-2	3-3
Local Codes and Regulations -----	102	1-12
Lots, Yards, Setbacks		
Building Parking Setback -----	303-2	3-4

M

Modular or Panelized Housing -----	613-1	6-15
Materials		
Bulletins, Use of Material -----	Appendix F	
New -----	101-1	1-11
Special Conditions -----	101-2	1-11
Special Construction Materials -----	513	5-9
Standards -----	Appendix C	
Medical Facilities -----	100-2.4	1-5
Metric Conversion -----	Appendix G	
Minimum Property Standards,		
Application -----	100	1-3

N

Natural Topography -----	301-1	3-3
Noise Control -----	302-2	3-3
Nursing Facilities -----	100-2.4	1-4

S

	Section	Page
Screening -----	608-3.3	6-8
Sealants -----	507-2	5-3
Sewage Disposal Systems		
Construction -----	615-3	6-16
Shakes		
Material -----	509-1	5-6
Site		
Access -----	204	2-4
Conditions -----	203	2-3
Conditions, Unforeseen -----	203-2	2-4
Design -----	300	3-3
Hazards -----	203	2-3
Proposed Site -----	301	3-3
Roads and Walks -----	602-2	6-3
Topography -----	301-1	3-3
Underground Utilities -----	602-1	6-3
Water, Ground -----	301-2	3-3
Slab, Concrete		
Exterior -----	603-2	6-4
Interior -----	603-1	6-4
Slope,		
Grading -----	306	3-4
Social and Community Rooms -----	100-2.3	1-4
Space Planning -----	401	4-3
Baths -----	401-2	4-3
Non-Residential -----	401-1	4-3
Special Construction -----	613	6-15
Special Construction Materials -----	513	5-9
Standards		
Application -----	100.1	1-3
Building Access -----	204.2	2-4
Existing Construction -----	100-5	1-10
Local Codes and Regulations -----	102	1-12
Nonresidential Use -----	401-1	4-3
Property Access -----	204-1	2-4
Proposed Construction -----	100-5	1-13
Real Estate Entry -----	201	2-3
Referenced -----	103	1-13
Rehabilitation -----	100-5	1-10
Variations -----	101	1-11
Swimming Pools -----	613-2	6-15

	Section	Page
Water Supply Systems		
Construction -----	615-2	6-16
Windows -----	508-4	5-4
Aluminum -----	508-4.3	5-5
Installation -----	608-3	6-8
Metal -----	508-4	5-4
Screens -----	608-3.3	6-8
Steel -----	508-4.2	5-5
Wood -----	508-5	5-5
Wood Construction -----	606-3	6-5

Y

Yard Space		
Building Parking -----	303-2	3-4
General -----	300	3-3
	303-1	3-4
Parking -----	304	3-4
Walks -----	305	3-4